Sales & Trading Interview Study Guide

Executive Summary

I. How to tell your "story"
II. Fit questions
III. Market Questions
IV. Technicals
V. Brainteasers

I. Telling your story

The most important question in any interview is "walk me through your resume" or "tell me about yourself" because first impressions are formed within the first few minutes. The below template will give you an effective format to answer those first few questions:

- **The Beginning:** Why you choose your university / major
- **Finance "Spark":** A Mentor You Met in One of Your Internships / Class lecture, etc.
- **Growing Interest:** Clubs You Joined Since Then and Your Most Recent Internship
- **Why You're Here:** Your Background + Sales & Trading= Long-Term Success
- **The Future:** Combine Your Expertise with Finance

You do *not* want to copy or memorize this template 100% word-for-word – use it as inspiration, but **you need to change it around** to match your own background.

Interviewer: Why don't you start by walking me through your resume?

Interviewee: Sure. I'm from **[Place Name]** originally, and spent most of my life there before moving to **[Location of Your College]** to explore another part of the country and to go to **[College Name]**.

Growing up, I was always really interested in **[Your Background Before This]**, and I did a lot of **[Activities, Sports, Hobbies Related to Background]** when I was younger.

Since **[College Name]** had a great reputation in this area and since I wanted to go somewhere really diverse for university, I applied there and decided to attend.

I decided to major in **[Major Name]** when I got there, since that's what I had always been interested in – and I joined **[Related Club]** and led a lot of the events there as well.

My first 2 internships were at **[Company Names]**, and although I did pretty well with the work itself and got some great recommendations, I wasn't completely satisfied – I was looking for something **[Faster-Paced / More Analytical / More**

Impactful/ where everyday would be different], and started to think about my different options.

One day at an intern event, I met **[Name/Description of Person]**, who was a Managing Director at **[Bank Name]** and who actually came from a similar background to me. We got to talking, and she told me all about her work on the trading floor and her professional path.

We stayed in touch, and I did some more research of my own, joining the **[Finance / Investment Club]** here and becoming a member of some case competition and stock investing teams. I liked this work a lot more, and also found that what I learned from **[Major Name]** was still helpful because of how much you had to **[Communicate / Crunch Numbers / Lead/ Analysis]** in business.

For my next internship, I went to **[Company Name]** and did **[Something Closer to Finance]** there, which was much closer to what I was looking for. Again, I did well but I realized that I wanted something **[Faster-Paced / More About the Market as a Whole]** instead, so I decided to pursue Sales & Trading instead.

I'm here today because I want the finance background that Sales & Trading gives me, and to one day become an **[trader/ salesperson]** – and I know that this **Citi's analyst program** is the best way to get there.

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*You can always recover from not knowing an answer to a technical question, but pitching you story poorly is harder to recover from.

II. Fit questions

- Why sales & trading?
- Why Citi?
- Why should we hire you?
- What are 3 of your strengths and weaknesses?
- Give me an example of a time you worked on a team.
- Are you quantitative?
- How do you stay on top of the markets?
- Give me an example of a failure.
- Give me an example of a time you had to deal with an ethically ambiguous situation.
- Tell me a joke.
- What would you like me to know that is not on your resume?
- Tell me about a time when you had to make a difficult decision.
- How would you handle a client who lost a ton of money?
- How would you describe your leadership style?
- Favorite class in college? Least favorite class in college?
- Do you see yourself in sales or trading? Why?
- How would a friend describe you? How would your boss describe you?

III. Market questions

- What did the S&P 500/Dow Jones Industrial Average/ Nasdaq close at yesterday?
- What is going on in the economy today? Where is it going and why? What do the recent economic data points mean for the economy?
- What's going on in the market?
- Where do you see the dollar trading and how will this impact the long-term government bond market?
- When will the Fed hike rates?
- Why is the Federal Reserve so concerned about inflation?
- Where do you see the dollar trading and how will this impact the long term government bond market?
- What is the relationship between interest rates and inflation?
- What do you think is the next big investment opportunity in the markets?
- What is the relationship between bond prices and yields?
- Pitch me a stock.
- If you had $1,000,000 to invest, how would you invest it? (Diversify)
- Know central bank rates of US, ECB, UK and Japan, what have they been doing over the last months, what does the term structure look like, why?
- Name 3 sectors that you are long. Name three sectors you are short.
- What are your views of the equity market/ bond market/ rates market/ FX market/ commodities market, etc? (You never know what your interviewer will specialize in).

- What did the Fed do at the last meeting? Do you agree with the Fed's actions? What do you think the Fed will do at the next meeting and why?
- What are the risks to owning a stock? A bond?

IV. Technicals (From Vault Guide and Investopedia)

STOCKS (Vault Guide)

Equity is also referred to as stock, and refers to ownership in a company. You should realize that companies do not have to be publicly traded in order to have stock- they just have to be incorporated and owned.

Equity vs. Debt (Stocks v. Bonds): Companies are traditionally financed through a combination of debt and equity. Equity, or ownership stake, is more volatile as its value fluctuates with the value of the firm. When we refer to stock, referring to common stock, or stock without a guaranteed return. Equity has a book value- this is a strictly defined value that can be calculated from the company's Balance Sheet. It also has a market value: stock price x number of shares outstanding (or common stock outstanding)= market value of equity. Any method used to measure either the book value or market value of a company depends on highly volatile factors such as performance of the company, the industry and the market as a whole- and is thus highly volatile itself. The other component of the financing of a company is debt, which is represented by securities called bonds. In its simplest form, debt is issued when investors loan money to a company at a given interest rate. Typically, banks and large financial institutions originate debt. **The returns for debt investors are assured in the form of interest on the debt**. Sometimes, the market value of the debt changes, but bond prices usually do not change as drastically as stock prices. On the downside, bonds also have lower expected returns than stocks. US Treasury bonds, for example, can provide returns of 5 to 7 percent a year or so, while volatile stocks may rise 10 percent in a single day. On the other hand, bonds usually have less downside risk than stocks.

In the middle of the continuum is preferred stock. One type of preferred stock is referred to as convertible preferred. If the preferred stock is convertible, it can be converted into common stock as prescribed in the initial issuance of the preferred stock. Like bondholders, holders of preferred stock are assured an interest-like return – also referred to as the preferred stock's dividend. (A dividend is a payment made to stockholders, usually quarterly, that is intended to distribute some of the company's profits to shareholders.)

The other key difference between preferred and common stock comes into play when a company goes bankrupt. In what is referred to as the seniority of creditors, the debt holders have first claim on the assets of the firm if the company becomes insolvent. Preferred shareholders are next in line, while the common stock shareholders bring up the rear. This isn't just a matter of having to wait in line

longer if you are a common stock shareholder. If the bondholders and owners of preferred stock have claims that exceed the value of the assets of a bankrupt company, the common stock shareholders won't see a dime.

There is a tax advantage for corporations who invest in preferred stock rather than in bonds for other companies. Corporate investors are taxed for only 30 percent of the dividends they receive on preferred stock. On the other hand, 100 percent of the interest payments on bonds paid to corporate investors are taxed. This tax rule comes in handy when structuring mergers.

Seniority of creditors:
1. Bondholders
2. Preferred stockholders
3. Common stockholders

Stock Terminology:

1) **Dividends**- Directors cannot pay any dividend to the common stock shareholders until they have paid all outstanding dividends to the preferred stockholders. The incentive for company directors to issue dividends is that companies in industries that art particularly dividend sensitive have better market valuations if they regularly issue dividends. Issuing regular dividends is a signal to the market that the company is doing well. Unlike, bonds, however, the company directors decide when to pay the dividend on preferred stock. In contrast, if a company fails to meet bond payment as scheduled, the bondholders can force the company into bankruptcy.
2) **Stock splits**- As a company grows in value, it sometimes splits its stock so that the prices does not become absurdly high. This enables the company to maintain the liquidity of the stock. If the Coca-Cola Company had never split its stock, the price of one share bought when the company's stock was first offered would be worth millions of dollars. If that were the case, buying and selling one share would be a very crucial decision. This would adversely affect a stock's liquidity (its ability to be freely traded on the market). In theory, splitting the stock neither creates nor destroys value. However, splitting the stock is generally received as a positive signal to the market; therefore, the share price typically rises when a stock split is announced.
3) **Stock buybacks**- Often companies will buy back their stock. Such an announcement is usually followed by an increase in the stock price. There are three reasons for this.
    a) **First**- the influence of earnings per share on market valuation. Many investors believe that if a company buys back shares, and the number of outstanding shares decreases, the company's earnings per share goes up. If the P/E (price to earnings per share ratio) stays stable, investors reason, the price should go up. Thus investors drive the stock price up in anticipation of increased earnings per share.
    b) **Second**- Signaling. No one understands the health of the company better than its senior managers. No one is in a better position to judge what will

happen to the future performance of the company. So if a company decides to buy back stock (decides to invest in its own stock), these managers must believe that the stock price is undervalued and will risk (or so most observers would believe). This is the signal company management sends to the market, and the market pushes the stock up in anticipation.

   c) **Third**- Debt tax shield. When a company buys back stock, its net debt goes up (net debt=debt-cash). Thus the debt tax shield associated with the company goes up and the valuation rises.

4) **New stock issues**- The reverse of a stock buyback is when a company issues new stock, which usually is followed by a drop in the company's stock price. As with stock buybacks, there are three main reasons for this movement. First, investors believe that issuing new shares dilutes earnings. That is, issuing new stock increases the number of outstanding shares, which decreases earnings per share, which – given a stable P/E ratio – decreases the share price. There is also the signaling effect. In other words, investors may ask why the company's senior managers decided to issue equity rather than debt to meet their financing requirements. Surely, investors may believe, management must believe that the valuation of their stock is high (possibly inflated) and that by issuing stock they can take advantage of this high price. Finally, if the company believes that the project for which they need money will definitely be successful, it would have issued debt, thus keeping all of the upside of the investment within the firm rather than distributing it away in the form of additional equity. The stock price also drops because of debt tax shield reasons. Because cash is flushed into the firm through the sale of equity, the net debt decreases. As net debt decreases, so does the associated debt tax shield.

Questions:

1. What kind of stocks would you issue for a startup?

A startup typically has more risk than a well-established firm. The kind of stocks that one would issue for a startup would be those that protect the downside of equity holders while giving them upside. Hence the stock issued may be a combination of common stock, preferred stock and debt notes with warrants (options to buy stock).

2. When should a company buy back stock?

When it believes the stock is undervalued, has extra cash, and believes it can make money by investing in itself. This can happen in a variety of situations. For example, if a company has suffered some decreased earnings because of an inherently cyclical industry (such as the semiconductor industry), and believes its stock price is unjustifiably low, it will buy back its own stock. On other occasions, a company will buy back its stock if investors are driving down the price precipitously. In this situation, the company is attempting to send a signal to the market that it is optimistic that its falling stock price is not justified. It's saying: "We know more than anyone else about our company. We are buying our stock back. Do you really think our stock price should be this low?"

3. Is the dividend paid on common stock taxable to shareholders? Preferred stock? Is it tax deductible for the company?

The dividend paid on common stock is taxable on two levels in the U.S. First, it is taxed at the firm level, as a dividend comes out from the net income after taxes (i.e., the money has been taxed once already). The shareholders are then taxed for the dividend as ordinary income (O.I.) on their personal income tax.

Dividend for preferred stock is treated as an interest expense and is tax-free at the corporate level.

4. When should a company issue stock rather than debt to fund its operations?
There are several reasons for a company to issue stock rather than debt. If the company believes its stock price is inflated it can raise money (on very good terms) by issuing stock. Second, if the projects for which the money is being raised may not generate predictable cash flows in the immediate future, it may issue stock. A simple example of this is a startup company. The owners of startups generally will issue stock rather than take on debt because their ventures will probably not generate predictable cash flows, which is needed to make regular debt payments, and also so that the risk of the venture is diffused among the company's shareholders. A third reason for a company to raise money by selling equity is if it wants to change its debt-to-equity ratio. This ratio in part determines a company's bond rating. If a company's bond rating is poor because it is struggling with large debts, the company may decide to issue equity to pay down the debt.

5. Why would an investor buy preferred stock?
1) An investor that wants the upside potential of equity but wants to minimize risk would buy preferred stock. The investor would receive steady interest-like payments (dividends) from the preferred stock that are more assured than the dividends from common stock. 2) The preferred stock owner gets a superior right to the company's assets should the company go bankrupt. 3) A corporation would invest in preferred stock because the dividends on preferred stock are taxed at a lower rate than the interest rates on bonds.

6. Why would a company distribute its earnings through dividends to common stockholders?
Regular dividend payments are signals that a company is healthy and profitable. Also, issuing dividends can attract investors (shareholders). Finally, a company may distribute earnings to shareholders if it lacks profitable investment opportunities.

7. What stocks do you like?
This is a question often asked of those applying for all equity (sales & trading, research, etc.) positions. (Applicants for investment banking and trading positions, as well as investment management positions, have also reported receiving this question.) If you're interviewing for one of these positions, you should prepare to talk about a couple of stocks you believe are good buys and some that you don't. This is also a question asked of undergraduate finance candidates to gauge their level of interest in finance.

8. What did the S&P 500 close at yesterday?
Another question designed to make sure that a candidate is sincerely interested in finance. This question (and others like it – "What's the Dow at now?" "What's the yield on the Long Bond?") can be expected especially of those looking for sales and trading positions.

9. Why did the stock price of XYZ company decrease yesterday when it announced increased quarterly earnings?
A couple of possible explanations: 1) the entire market was down, (or the sector to which XYZ belongs was down), or 2) even though XYZ announced increased earnings, the Street was expecting earnings to increase even more.

10. Can you tell me about a recent IPO that you have followed?
Read *The Wall Street Journal* and stay current with recent offerings. **11. What is your investing strategy?**
Different investors have different strategies. Some look for undervalued stocks, others for stocks with growth potential and yet others for stocks with steady performance. A strategy could also be focused on the long-term or short-term, and be more risky or less risky. Whatever your investing strategy is, you should be able to articulate these attributes.

12. How has your portfolio performed in the last five years?
If you are applying for an investment management firm as an MBA, you'd better have a good answer for this one. If you don't have a portfolio, start a mock one using Yahoo! Finance or other tools. Also, if you think you are going to say it has outperformed the S&P each year, you better be well prepared to explain why you think this happened.

13. If you read that a given mutual fund has achieved 50 percent returns last year, would you invest

in it?
You should look for more information, as past performance is not necessarily an indicator of future results. How has the overall market done? How did it do in the years before? Why did it give 50 percent returns last year? Can that strategy be expected to work continuously over the next five to 10 years? You need to look for answers to these questions before making a decision.

14. You are on the board of directors of a company and own a significant chunk of the company. The CEO, in his annual presentation, states that the company's stock is doing well, as it has gone up 20 percent in the last 12 months. Is the company's stock in fact doing well?
Another trick stock question that you should not answer too quickly. First, ask what the Beta of the company is. (Remember, the Beta represents the volatility of the stock with respect to the market.) If the Beta is 1 and the market (i.e. the Dow Jones Industrial Average) has gone up 35 percent, the company actually has not done too well compared to the broader market.

15. Which do you think has higher growth potential, a stock that is currently trading at $2 or a stock that is trading at $60?
This question tests your fundamental understanding of a stock's value. The short answer to the question is, "It depends." While at first glance it may appear that the stock with the lower price has more room for growth, price does not tell the entire picture. Suppose the $2 stock has 1 billion shares outstanding. That means it has $2 billion market cap, hardly a small cap stock. On the flip side, if the $60 stock has 20,000 shares gives it a market cap of $1,200,000, and hence it is extremely small and is probably seen as having higher growth potential. Generally, high growth potential has little to do with a stock's price, and has more to do with it's operations and revenue prospects.

16. What do you think is happening with ABC stock?
Expect to be asked this question if you say you like to follow a given sector like technology or pharmaceuticals. Interviewers will test you to see how well you know your industry. In case you don't know that stock, admit it, and offer to describe a stock in that sector that you like or have been following.

17. Where do you think the DJIA will be in three months and six months – and why?
Nobody knows the answer to this one. However, you should at least have some thoughts on the subject and be able to articulate why you take your stance. If you have been following the performance of major macroeconomic indicators (which will be reviewed in the next section), you can state your case well.

18. Why do some stocks rise so much on the first day of trading after their IPO and others don't? How is that money left on the table?
By "money left on the table," bankers mean that the company could have successfully completed the offering at a higher price, and that the difference in valuation thus goes to initial investors rather than the company. Why this happens is not easy to predict from responses received from investors during roadshows. Moreover, if the stock rises a lot the first day it is good publicity for the firm. But in many ways it is money left on the table because the company could have sold the same stock in its initial public offering at a higher price. However, bankers must honestly value a company and its stock over the long-term, rather than simply trying to guess what the market will do. Even if a stock trades up significantly initially, a banker looking at the long-term would expect the stock to come down, as long as the market eventually correctly values it.

19. What is insider trading and why is it illegal?
Undergraduates may get this question as feelers of their general knowledge of the finance industry. Insider trading describes the illegal activity of buying or selling stock based on information that is not public information. The law against insider trading exists to prevent those with privileged information (company execs, I-bankers and lawyers) from using this information to make a tremendous amount of money unfairly.

20. Who is a more senior creditor, a bondholder or stockholder?
The bondholder is always more senior. Stockholders (including those who own preferred stock) must wait until bondholders are paid during a bankruptcy before claiming company assets.

BONDS and Interest Rates (Vault Guide)

A bond is a borrowing arrangement through which the borrower (or seller of a bond) issues or sells an IOU document (the bond) to the investor (or buyer of the bond). The arrangement obligates the borrower to make specified payments to the bondholder on agree-upon dates. For example, if you purchase a five year US Treasury note, the US government is borrowing money from you for a period of five years. Meanwhile, if you choose not to keep the bond until it matures, you can sell the bond in the market for the current value of the future interest payments and the end principle.

Bond Terminology:

Par value or face value of a bond: This is the total amount the bond issuer will commit to pay back at the end of the bond maturity period (when the bond expires).

Coupon payments: The payments of interest that the bond issuer makes to the bondholder. These are often specified in terms of coupon rates. The coupon rate is the bond coupon payment divided by the bond's par value.

Bond price: The price the bondholder (i.e. the lender) pays the bond issuer (i.e. the borrower) to hold the bond (to have a claim on the cash flows documented on the bond).

Default risk: The risk that the company issuing the bond may go bankrupt, and default on its loans.

Default premium: The difference between the promised yields on a corporate bond and the yield on an otherwise identical government bond. In theory, the difference compensates the bondholder for the corporation's default risk.

Credit ratings: Bonds are rated by credit agencies (Moody's, Standard & Poor's), which examine a company's financial situation, outstanding debt, and other factors to determine the risk of default. Companies guard their credit ratings closely, because the higher the rating, the easier they can raise money and the lower the interest rate.

Investment grade bonds: These bonds have high credit ratings, and pay a relatively low rate of interest.

Junk bonds: Also known as high yield bonds, these bonds have poor credit ratings, and pay a relatively high rate of interest.

U.S. Treasury bills, notes, and bonds: Bills mature in one year or less, notes in two to 10 years., and bonds in 30 years. (The 30-year U.S. Treasury bond is also called The Long Bond.)

Pricing Bonds

The price of a bond is the net present value of all future cash flows expected from that bond.

$$\text{Bond Value} = \sum_{t=1}^{T}\left(\frac{\text{Coupon}}{(1+r)^t}\right) + \frac{\text{Par Value}}{(1+r)^T}$$

Here:

r = Discount rate

t = Interval (for example, 6 months)

T = Total payments

First, we must ask what discount rate should be used? Remember from our discussion of valuation techniques that discount rate for a cash flow for a given period should be able to account for the risk associated with the cash flow for that period. In practice, there will be different discount rates for cash flows occurring in different periods. However, for the sake of simplicity, we will assume that the discount rate is the same as the interest rate on the bond.

So, what is the price of the bond described earlier? From the equation above we get:

$$\text{Price} = \sum_{t=1}^{T}\left(\frac{\$40}{(1+.04)^t}\right) + \frac{\$1000}{(1+.04)^{60}}$$

To do this calculation use a financial calculator or present value tables. In this case, the interest rate is 4 percent and T is 60. Using the Present Value tables we get
=$904.94+$95.06
=$1000

The bond price depends on the interest rate. If the interest rate is higher, the bond price is lower and vice versa.

The Yield to Maturity (YTM) is the measure of the average rate of return that will be earned on a bond if it is bought now and held until maturity. To calculate this, we need the information on bond price, coupon rate and par value of the bond.

Example: Suppose an 8% coupon, 30-year bond is selling at $1,276.76. What average rate of return would be earned if you purchase the bond at this price?

To answer this question, we must find the interest rate at which the present value of the bond payments equals the bond price. This is the rate that is consistent with the observed price of the bond. Therefore, we solve for r in the following equation.

$$\$1276.76 = \sum_{t=1}^{60}\left(\frac{\$40}{(1+r)^t}\right) + \frac{\$1,000}{(1+r)^{60}}$$

This equation can be solved using a financial calculator; in completing the calculation we see that the bond's yield to maturity is 3 percent semi-annually.

Callable Bonds

Previously, we assumed that the discount rate was equal to the interest rate, and that the interest rate was constant at the coupon rate. However, in the real world, this is not always the case. **If the interest rate falls, bond prices can rise substantially, due to the concept of opportunity cost of investments**.

For example: A company has a bond outstanding. It took $810.71 and promised to make the coupon payments at $40 every six months. Let's say the market interest rates dropped below 8 percent. According to the bond document, the company is still expected to pay the coupon at a rate of 8 percent. **If the interest rates were to drop in this manner, the company would be paying a coupon rate much higher than the market interest rate today. In such a situation, the company may want to buy the bond back so that it is not committed to paying large coupon payments in the future. This is referred to as calling the bond. However, as an issuer can only call a bond if the bond was originally issued as a callable bond. The risk that a bond will be called is reflected in the bond's price. The yield calculated up to the period when the bond is called back is referred to as the yield to call**.

Zero Coupon Bonds

This type of bond offers no coupon or interest payments to the bondholder. The only payment the zero coupon bondholder receives is the payment of the bond face value upon maturity. The returns on their coupon bonds must be obtained by paying a lower initial price than their face value for them. These bonds are priced at a considerable discount to par value.

Forward Rates

These are agreed upon interest rates for a bond to be issued in the future. For

example, the one year forward rate for a five year US Treasury note represents the interest forward rate on a five year T-note that will be issued one year from now (and that will mature six years from now). This "forward" rate changes daily just like the rates of already issued bonds. It is essentially based on the market's expectation of what the interest rate a year from now will be, and can be calculated using the rates of current bonds.

The Fed and Interest Rates

The Federal Reserve Board has broad responsibility for the health of the US financial system. In this role, the Fed sets the margin requirements on stocks and options, and regulates bank lending to securities market participants. The Fed also has the responsibility of formulating the nation's monetary policy. In determining the monetary policy of the nation, the Fed manipulated the money supply to effect the macroeconomy. When the Fed increases the money supply going into the economy, the monetary policy set by the Fed is said to be expansionary. This encourages investment and subsequently increases consumption demand. In the long run, however, an expansionary policy can lead to higher prices and inflation. Therefore, it is the Fed's responsibility to maintain a proper balance and prevent the economy from both hyperinflation or recession.

The Fed uses several tools to regulate the money supply.

1) **Open Market Operations**- The Fed can "write a check" to buy securities and thereby increase the money supply to do such things as buy back government bonds in the market. Unlike the rest of us, the Fed doesn't have to pay the money for a check it has written. An increase in the country's money supply stimulates the economy. Likewise, if the Fed sells securities, the money paid for them leaves the money supply and slows the economy.
2) **Raise or lower the interest rates**- The Fed can raise or lower interest rates by changing a) the discount rate (the interest rate the Fed charges banks on short term loans and/or b) the Federal Funds rate (or Fed Funds rate), the rate banks charge each other on short term loans. When the Fed raises or lowers interest rates, banks usually quickly follow by raising or lowering their prime rate (the rate banks charge on loans to its most creditworthy customers). A reduction of the interest rate signals an exansionary monetary policy. Because by reducing the interest of its loans to banks, the Fed allows banks to lend out money at lower rates. More businesses and individuals are willing to take out loans, thus pouring more money into the economy. – lowers the incentive to save, lower opportunity cost of spending more.
3) **Manipulate the reserve requirements for various banks to control the money flows and thereby the interest rate**. – All banks that are members of the Federal Reserve System are required to maintain a minimum balance in a reserve account with the Fed. These minimum deposits are referred to as "reserve requirements." Lowering the reserve requirements for various banks has the same expansionary effect. This move allows banks to make more loans with the deposits it has and thereby stimulates the economy by increasing the money supply.

An increase in the money supply usually results in investors having too much money in their portfolios, which leads them to buy more stocks and bonds and gives them more discretionary income. In part, this action increases the demand for bonds, drives up bond prices, and thereby reduces interest rates. More money available also increases demand for stocks and real estate. This availability leads to higher investments and greater demand for goods.

The Fed and Inflation

Inflation is the rise of prices over time. Prices rise over time because of increases in population and resultant demands for products. Inflation directly affects interest rates. If lending money is healthy for the economy because it promotes growth, interest rates much be higher than inflation. Thus, the Federal Reserve watches inflation closely as part of its role of setting interest rates.

Lenders issuing long-term loans such as mortgages can also issue what are called floating rate (or adjustable) loans, whose yield depends on an interest rate (like the prime rate) which adjusts to account for changes in inflation. Using floating rates, lenders can be protected from inflation.

At the same time, some inflation (usually around 1 to 2 percent) is a sign of a healthy economy. If the economy is healthy and the stock market growing, consumer spending increases. This means that people are buying more goods, and by consequence, more goods are demanded. No inflation means that you do not have a robust economy.

From micro, we know that if the demand rises because of higher personal income, the new equilibrium price is higher. Once prices rise, supply rises more (sellers of goods enter the market to take advantage of the opportunity- growth in macro terms). Hence, prices reach a new equilibrium above the previous equilibrium.

Effects of Inflation on Bond Prices

The effect of inflation on bond prices is very simple: when inflation goes up, interest rates rise. And when interest rates rise, bond prices fall. Therefore, when **inflation goes up, bond prices fall. In general, a positive economic event (such as a decrease in unemployment, greater consumer confidence, higher personal income, etc.) drives up inflation over the long term (because there are more people working, there is more money to be spent), which drives up interest rates, which causes a decrease in bond prices.**

Economic Event	Inflation	Interest Rates	Bond Prices
Unemployment figures low	Up	Up	Down
Dollar weakens against Yen	Up	Up	Down
Consumer confidence low	Down	Down	Up
Stock Market drops	Down	Down	Up
Companies report healthy earnings	Up	Up	Down

Leading Economic Indicators and whether their rise or fall signal positive economic events or negative economic events.

Indicator	Positive Economic Event	Negative Economic Event
GDP	Up	Down
Unemployment	Down	Up
Inflation	Down	Up
Consumer Price Index	Down	Up
Interest Rate	Down	Up
New Home Sales	Up	Down
Existing Home Sales	Up	Down

Questions:

1. What is the relationship between a bond's price and its yield?
They are inversely related. That is, if a bond's price rises, it's yield falls, and vice versa. Simply put, current yield = interest paid annually / market price * 100%.

2. How are bonds priced?
Bonds are priced based on the net present value of all future cash flows expected from the bond.

3. How would you value a perpetual bond that pays you $1,000 a year in coupon?
Divide the coupon by the current interest rate. For example, a corporate bond with an interest rate of 10 percent that pays $1,000 a year in coupons forever would be worth $10,000.

4. When should a company issue debt instead of issuing equity?
First, a company needs a steady cash flow before it can consider issuing debt (otherwise, it can quickly fall behind interest payments and eventually see its assets seized). Once a company can issue debt, it should almost always prefer issuing debt to issuing equity.
Generally, if the expected return on equity is higher than the expected return on debt, a company will issue debt. For example, say a company believes that projects completed with the $1 million raised through either an equity or debt offering will increase its market value from $4 million to $10 million. It also knows that the same amount could be raised by issuing a $1 million bond that requires $300,000 in interest

payments over its life. If the company issues equity, it will have to sell 20 percent of the company, or $1 million/$5 million ($5 million is the new value of the company after the capital infusion). This would then grow to 20 percent of $10 million, or $2 million. Thus, issuing the equity will cost the company $1 million ($2 million - $1 million). The debt, on the other hand, will only cost $300,000. The company will therefore choose to issue debt in this case, as the debt is cheaper than the equity.
Also, interest payments on bonds are tax deductible. A company may also wish to issue debt if it has taxable income and can benefit from tax shields.
Finally, issuing debt sends a quieter message to the market regarding a company's cash sitation.

5. What major factors affect the yield on a corporate bond?
The short answer: 1) interest rates on comparable U.S. Treasury bonds, and 2) the company's credit risk. A more elaborate answer would include a discussion of the fact that corporate bond yields trade at a premium, or spread, over the interest rate on comparable U.S. Treasury bonds. (For example, a five-year corporate bond that trades at a premium of 0.5 percent, or 50 basis points, over the five-year Treasury note is priced at 50 over.) The size of this spread depends on the company's credit risk: the riskier the company, the higher the interest rate the company must pay to convince investors to lend it money and, therefore, the wider the spread over U.S. Treasuries.

6. If you believe interest rates will fall, which should you buy: a 10-year coupon bond or a 10-year zero coupon bond?
The 10-year zero coupon bond. A zero coupon bond is more sensitive to changes in interest rates than an equivalent coupon bond, so its price will increase more if interest rates fall.

7. Which is riskier: a 30-year coupon bond or a 30-year zero coupon bond?
A 30-year zero coupon bond. Here's why: A coupon bond pays interest semi- annually, then pays the principal when the bond matures (after 30 years, in this case). A zero coupon bond pays no interest, but pays one lump sum upon maturity (after 30 years, in this case). The coupon bond is less risky because you receive some of your money back before over time, whereas with a zero coupon bond you must wait 30 years to receive any money back. (Another answer: The zero coupon bond is more risky because its price is more sensitive to changes in interest rates.)

8. What is The Long Bond trading at?
The Long Bond is the U.S. Treasury's 30-year bond. This question is particularly relevant for sales and trading positions, but also for corporate finance positions, as interviewers want to see that you're interested in the financial markets and follow them daily.

9. If the price of the 10-year Treasury note rises, does the note's yield rise, fall or stay the same?
Since bond yields move in the opposite direction of bond prices, if the price of a 10-year note rises, its yield will fall.

10. If you believe interest rates will fall, should you buy bonds or sell bonds?
Since bond prices rise when interest rates fall, you should buy bonds.

11. How many basis points equal .5 percent?
Bond yields are measured in basis points, which are 1/100 of 1 percent. 1 percent = 100 basis points. Therefore, .5 percent = 50 basis points.

12. Why can inflation hurt creditors?
Think of it this way: If you are a creditor lending out money at a fixed rate, inflation cuts into the percentage that you are actually making. If you lend out money at 7 percent a year, and inflation is 5 percent, you are only really clearing 2 percent.

13. How would the following scenario affect the interest rates: the President is impeached and convicted.
While it can't be said for certain, chances are that these kind of events will lead to fears that the economy will go into recession, so the Fed would want to balance those fears by lowering interest rates to expand the economy.

14. What does the government do when there is a fear of hyperinflation?
The government has fiscal and monetary policies it can use in order to control hyperinflation. The monetary policies (the Fed's use of interest rates, reserve requirements, etc.) are discussed in detail in this chapter. The fiscal policies include the use of taxation and government spending to regulate the aggregate level of economic activity. Increasing taxes and decreasing government spending slows down growth in the economy and fights inflation.

15. Where do you think the U.S. economy will go over the next year?
Talking about the U.S. economy encompasses a lot of topics: the stock market, consumer spending, unemployment, to name a few. Underlying all these topics is the way interest rates, inflation, and bonds interact. Make sure you can speak articulately about relevant concepts discussed in this chapter when forming a view on the U.S. economic future.

16. How would you value a perpetual zero coupon bond?
The value will be zero. A zero coupon doesn't pay any coupons, and if that continues on perpetually, when do you get paid? Never – so it ain't worth nothing!

17. Let's say a report released today showed that inflation last month was very low. However, bond prices closed lower. Why might this happen?
Bond prices are based on expectations of future inflation. In this case, you can assume that traders expect future inflation to be higher (regardless of the report on last month's inflation figures) and therefore they bid bond prices down today. (A report which showed that inflation last month was benign would benefit bond prices only to the extent that traders believed it was an indication of low future inflation as well.)

18. If the stock market falls, what would you expect to happen to bond prices, and interest rates?
You would expect that bond prices would increase and interest rates would fall.

19. If unemployment is low, what happens to inflation, interest rates, and bond prices?
Inflation goes up, interest rates also increase, and bond prices decrease.

20. What is a bond's "Yield to Maturity"?
A bond's yield to maturity is the yield that would be realized through coupon and principal payments if the bond were to be held to the maturity date. If the yield is greater than the current yield (the coupon/price), it is said to be selling at a discount. If the yield is less than the current yield, it is said to be selling at a premium.

10. What do you think the Fed will do with interest rates over the next 2 years?
This question is particularly relevant in 2004, when the fed funds rate has hit an all-time low. As the economy recovers, one can reasonably expect that the fed will raise the rate slowly to stunt inflation by taking money out of the overall money supply. Presumably, the increase in production as the economy gets better will make up for the tightening policy. However, there is no right answer to this question. If you think the economy will not get better, you can easily make a case that the fed wont raise rates. However, be prepared to back up your answer either way.

Municipals (Investopedia)

While municipal bonds are available in both taxable and tax-exempt formats, the tax-exempt bonds tend to get the most attention because the income they generate is for most investors exempt from federal and, in many cases, state and local income taxes.

Two Varieties

Municipal bonds come in the following two varieties:

- general obligation bonds (GO)
- revenue bonds

General obligation bonds, issued to raise immediate capital to cover expenses, are supported by the taxing power of the issuer. Revenue bonds, which are issued to fund infrastructure projects, are supported by the income generated by those projects. Both types of bonds are tax exempt and particularly attractive to risk-averse investors due to the high likelihood that the issuers will repay their debts.

Risk Factors

While buying municipals bonds is viewed as a conservative investment strategy, it is not risk-free. The following are the risk factors:

Credit Risk: If the issuer is unable to meets its financial obligations, it may fail to make scheduled interest payments and/or be unable to repay the principal upon maturity. To assist in the evaluation of an issuer's creditworthiness, ratings agencies (such as Moody's Investors Service and Standard & Poor's), analyze a bond issuer's ability to meet its debt obligations, and issue ratings from 'Aaa' or 'AAA' for the most creditworthy issuers to 'Ca', 'C', 'D', 'DDD', 'DD' or 'D' for those in default. Bonds rated 'BBB', 'Baa' or better are generally considered appropriate investments when capital preservation is the primary objective. To reduce investor concern, many municipal bonds are backed by insurance policies guaranteeing repayment in the event of default.

Interest-Rate Risk: The interest rate of most municipal bonds is paid at a fixed rate. The rate does not change over the life of the bond. If interest rates in the marketplace rise, the bond you own will be paying a lower yield relative to the yield offered by newly issued bonds.

Tax-Bracket Changes*:* Municipal bonds generate tax-free income, and therefore pay lower interest rates than taxable bonds. Investors who anticipate a significant drop in their marginal income-tax rate may be better served by the higher yield available from taxable bonds.

Call Risk*:* Many bonds allow the issuer to repay all or a portion of the bond prior to the maturity date. The investor's capital is returned with a premium added in exchange for the early debt retirement. While you get your entire initial investment plus some back if the bond is called, your income stream ends earlier than you were expecting it to.

Market Risk: The underlying price of a particular bond changes in response to market conditions. When interest rates fall, newly issued bonds will pay a lower yield than existing issues, which makes the older bonds more attractive. Investors who want the higher yield may be willing to pay a premium to get it. Likewise, if interest rates rise, newly issued bonds will pay a higher yield than existing issues. Investors who buy the older issues are likely to do so only if they get it at a discount. If you buy a bond and hold it until maturity, market risk is not a factor because your principal investment will be returned in full at maturity. Should you choose to sell

prior to the maturity date, your gain or loss will be dictated by market conditions, and the appropriate tax consequences for capital gains or losses will apply.

Buying Strategies
The most basic strategy for investing in municipal bonds is to purchase a bond with an attractive interest rate, or yield, and hold the bond until it matures. The next level of sophistication involves the creation of a municipal bond ladder. A ladder consists of a series of bonds, each with a different interest rate and maturity date. As each rung on the ladder matures, the principal is reinvested into a new bond. Both of these strategies are categorized as passive strategies because the bonds are bought and held until maturity.

Investors seeking to generate both income and capital appreciation from their bond portfolio may choose an active portfolio management approach whereby bonds are bought and sold instead of held to maturity. This approach seeks to generate income from yields and capital gains from selling at a premium.

Mortgage Backed Securities (Investopedia)

A type of asset-backed security that is secured by a mortgage or collection of mortgages. These securities must also be grouped in one of the top two ratings as determined by a accredited credit rating agency, and usually pay periodic payments that are similar to coupon payments. Furthermore, the mortgage must have originated from a regulated and authorized financial institution. When you invest in a mortgage-backed security you are essentially lending money to a home buyer or business. An MBS is a way for a smaller regional bank to lend mortgages to its customers without having to worry about whether the customers have the assets to cover the loan. Instead, the bank acts as a middleman between the home buyer and the investment markets. This type of security is also commonly used to redirect the interest and principal payments from the pool of mortgages to shareholders. These payments can be further broken down into different classes of securities, depending on the riskiness of different mortgages as they are classified under the MBS.

Currencies (Vault Guide)

The strength and stability of currencies influence trade and foreign investment.

Spot exchange rate: The price of one currency relative to another, i.e., the number of one currency you can buy using another currency. (The exchange rate people commonly talk about is actually the spot exchange rate).

Example: Let's say that today the spot rate of U.S. dollars to the British pound is $1.5628/£1. If you go to the bank today, and present a teller with $1,562.80, you will receive £1,000.

Forward exchange rate: The prices of currencies at which they can be bought and sold for future delivery.

Example: Let's say that today the one-month forward rate for British pound is $1.5629, the three-month rate is $1.5625, and the one-year rate is $1.5619. These represent the prices at which the market (buyers and sellers) would agree (today) to exchange currencies one month, three months, or a year from now.

In this example, the dollar is said to be trading at a one-month forward discount, because you can get fewer pounds for the dollar in the future than you can today. Alternately, the dollar is trading at a forward premium for a three month or one year period, because you can get more pounds for the dollar in the future than you can today.

Exchange Rates: The perfect market exchange rate between two currencies is determined primarily by two factors: the interest rates in the two countries and the rates of inflation in the two countries. However, in the real world, governments of many countries regulate the exchange rate to control growth and investment of foreign capital in the economy.

Strong/weak currencies: When a currency is strong, that means its value is rising relative to other currencies. This is also called currency appreciation. When a currency is weak, its value is falling relative to other currencies. This is also called currency depreciation.

Example: Let's say the dollar-pound exchange rate on January 1 is $1.50/£1. Three months later, on March 1, the exchange rate is $1.60/£1. The dollar has weakened, or depreciated against the pound, because it takes more dollars to equal one pound.

Influence of Interest Rates on Foreign Exchange

If the interest rate of a foreign country relative to the home country goes up, the home currency weakens. In other words, it takes more of the home currency to buy the same amount of foreign currency. (Note: we are talking about the real interest rate, or the interest rate after inflation. If interests rates and inflation were to go up by the same amount, the effect on the country's currency would generally be a wash).

Example: Let's say the risk-free interest rate in the U.S. is 5 percent; and in the U.K. it is 10 percent. Let's also assume that the exchange rate today is $1.5/£1. If the U.K. interest rate rises to 12 percent, the British pound will tend to strengthen against the dollar.

When interest rates in a country rise, investments held in that country's currency (ex: bonds) will earn a higher rate of return. Therefore, when a country's interest rates rise, money and investments will tend to flow to that country, driving up the value of its currencies (The reverse is true when a country's interest rates fall.).

Influence of Inflation on Foreign Exchange

If the inflation in the foreign country goes up relative to the home country, the foreign currency devalues or weakens relative to the home currency. In other words, it takes less of the home currency to buy the same amount of foreign currency.

Advanced Explanation: Let's say again that at the beginning of the year, silver costs $1,500/lb in the U.S. and £1,000/lb in the U.K. At the same time, it takes $1.5 to buy £1. Let us now assume that inflation in the U.K. is at 10 percent while inflation in the U.S. is at 0 percent.

At the end of the year, the silver still costs $1,500/lb in the U.S., but it costs £1,100/lb in the U.K. because of inflation. If the exchange rate were to remain the same, people would start buying silver in the U.S., selling it in the U.K., and converting their money back to dollars, thus making a tidy profit. In other words, if you had $1,500, you would buy a pound of silver in U.S., sell it in the U.K. for £1,100 at the end of the year, convert the British pounds into dollars at $1.5/£1, thus receiving $1,650. For each pound of silver with which you did this, you would make a neat profit of $150. If you were to do that with a billion dollars worth of silver, you could pay for the travel expenses and buy homes in London and New York. You would have been able to take advantage of the inflation in the U.K. and created an arbitrage opportunity.

In the real world, this does not happen. If there is inflation in the U.K., the value of the pound will weaken. This is given by the relationship below.

$$\frac{f\$/£}{s\$/£} = \frac{(1 + i\$)}{(1 + i£)}$$

f- forward rate
s- spot rate

Capital Market Equilibrium:
The principle of capital market equilibrium (CME) states that there should be equilibrium in the currency markets all over the world so that there is no arbitrage opportunity in shifting between two currencies.

$$\frac{Rs60}{£1} \times \frac{£1}{\$1.5} = \frac{Rs40}{\$1}$$

The three factors: These three factors- interest rates, inflation, and the principle of capital market equilibrium- govern the valuation of various currencies. Because the US dollar is generally considered the world's most stable currency, it is the widely accepted basis for foreign exchange valuation. Other currencies that are considered stable are the Japanese yen and the Euro.

Exchange Rate Effects on Earnings:
Companies that do business abroad are exposed to currency risk. For example, if a US company that manufactures goods in the US sells them in England, its quarterly earnings will fluctuate based on fluctuating dollar-pound exchange rates.

If the dollar weakens (one dollar can buy fewer pounds), the company's earnings will increase because when the pounds earned by selling the product are sent back to the US, they will be able to buy more dollars. If the dollar strengthens, then the

earnings will go down.

Economic Event	Effect on Earnings of U.S. Multinational Companies	Inflation	Interest Rates
U.S. Dollar Strengthens	Negative	Falls	Fall
U.S. Dollar Weakens	Positive	Rises	Rise

Effect of Exchange Rates on Interest Rates and Inflation

A weak dollar means that the prices of imported goods will rise when measured in US dollars (it will take more dollars to buy the same good). When the prices of imported goods rise, this contributes to higher inflation, which also raises interest rates. Conversely, a strong dollar means that the prices of imported goods will fall, which will lower inflation (which will lower interest rates).

Economic Event	Effect on Dollar
U.S. (Real) Interest Rates Rise	Strengthens
U.S. (Real) Interest Rates Fall	Weakens
U.S. Inflation Rates Rise	Weakens
U.S. Inflation Rates Fall	Strengthens

Under a fixed exchange rate system in which exchange rates are changed only by official government action, a weakening of the currency is called devaluation. A strengthening of the currency under fixed exchange rates is called revaluation, rather than appreciation.

Type of exchange rate system	Home currency strengthens	Home currency weakens
Flexible	Appreciation	Depreciation
Fixed	Revaluation	Devaluation

Questions:

1. What is the currency risk for a company like Microsoft? What about Ford?

Microsoft and Ford have different currency risks. Let's take Microsoft first. Its currency risks are created by its sales in foreign countries. For example, if it markets a software program for 100 RMB in China, and the dollar strengthens against the RMB (and the company doesn't change its price), Microsoft will be making less in U.S. dollars than it had previously anticipated. (Of course, it can react by changing its prices.)

Now let's examine Ford's currency risks. Like Microsoft, Ford is vulnerable to currency risks because it sells products in foreign currencies. In addition, the auto giant is vulnerable because it manufactures cars overseas. Let's say the company has manufacturing operations in Mexico, where cars are built, and later sold in the U.S. The cost of those operations will be sensitive to the price of the peso relative to the dollar. If the peso weakens, Ford can make its cars cheaper, sell them for lower prices, and thus gain a competitive advantage. But the opposite is also true. If the peso strengthens, Ford's labor costs will shoot

up. In contrast, Microsoft doesn't have manufacturing costs overseas (most of its production costs are spent in Redmond rather than at cheaper production facilities overseas). Ford's currency risk is further complicated because some of its major competitors are in countries outside the U.S. For example, the price of the mark and the yen influences the prices at which German and Japanese competitors sell their cars. Thus Ford has greater currency risk than Microsoft.

2. When the currencies in countries like Thailand, Indonesia, and Russia fell drastically in 1998, why were U.S. and European-based investment banks hurt so badly?
I-banks were hurt on trading losses in Asia and Russia. If banks held either currency or bonds in the currencies that dropped, these assets suddenly turned non-performing, in other words, essentially worthless. (In fact, Russia's government defaulted on its government-backed bonds, so firms weren't just hurt by dropping currencies but also by loan defaults.)

3. If the U.S. dollar weakens, should interest rates generally rise, fall or stay the same?
Rise. A weak dollar means that the prices of imported goods will rise when measured in U.S. dollars (i.e., it will take more dollars to buy the same good). Rising prices of imported goods contributes to higher inflation, which raises interest rates.

4. If U.S. inflation rates fall, what will happen to the relative strength of the dollar?
It will strengthen.

5. If the interest rate in Brazil increases relative to the interest rate in the U.S., what will happen to the exchange rate between the Brazilian real and the U.S. dollar?
The real will strengthen relative to the dollar.

6. If inflation rates in the U.S. fall relative to the inflation rate in Russia, what will happen to the exchange rate between the dollar and the rouble?
The dollar will strengthen relative to the rouble.

7. What is the difference between currency devaluation and currency depreciation?
Devaluation occurs in a fixed-exchange-rate system and is usually fixed as a function of governement policy, while depreciation occurs when a country allows its currency to move according to the international currency exchange market.

8. What is the effect on U.S. multinational companies if the U.S. dollar strengthens?
U.S. multinationals see their earnings decrease when the dollar strengthens. Essentially, sales in foreign currencies don't amount to as many U.S. dollars when the dollar strengthens.

9. What are some of the main factors that govern foreign exchange rates?
Chiefly: interest rates, inflation, and capital market equilibrium.

10. If the spot exchange rate of dollars to pounds is $1.60/£1, and the one-year forward rate is $1.50/£1, would we say the dollar is forecast to be strong or weak relative to the pound?
The forward exchange rate indicates the rate at which traders are willing to exchange currencies in the future. In this case, they believe that the dollar will strengthen against the pound in the coming year (that one dollar will be able to buy more pounds one year from now than it can now).

Options and Derivatives (Vault Guide)

Derivatives aren't the most trusted financial instrument.
Warren Buffet, "I view them as time bombs, both for the parties that deal in them and the economic system."

Derivatives are often used to hedge financial positions. Hedging is a financial strategy designed to reduce risk by balancing a position in the market. Often, hedges work like insurance: a small position pays off large amounts if the price of a certain

security reaches a certain price. On other occasions, derivatives are used to hedge positions by locking in prices.

Options:
Most common derivative.
Options- **give the bearers the "option" to buy or sell a security- without the obligation to do so.**

Call Options: **A call option gives the holder the right to purchase an asset for a specified price on or before a specified expiration date**. (This def. refers to an American option- which is assumed going forward. Standard European call options can only be converted on the expiration date). The specified price is called the **exercise price or strike price**.
EX: A July 1 call option on IBM stock has an exercise price of $70. The owner of this option is entitled to purchase IBM stock at $70 at anytime up to and including the expiration date of July 1. If in June, the price of IBM stock jumps up to $80, the holder can exercise the option to buy stock from the option seller for $70. The holder can then turn around and sell it to the market for $80 and make a neat profit of $10 per share (minus the price of the option). Or the holder can hold onto the number of shares purchased through the option.

At the money call- when a call option's exercise price is exactly equal to the current stock price.
In the money call- when a call option has an exercise price that is less than the current stock price.
Out of the money call- when a call option's exercise price is greater than the current stock price.

Put Options:
A put option gives its holder the right to sell an asset for a specified exercise price on or before a specified expiration date.

EX: A July 1 put option on IBM with an exercise price of $70 entitles its owner to sell IBM stock at $70 at any time before it expires in July, even if market price is lower than $70. So if the price drops to $60, the holder of the put option would buy the stock at $60, sell it for $70 by exercising her option, and make a neat profit of $10 (minus the price of the option). On the other hand, if the price goes over $70, the holder of the put option will not exercise the option and will lose the amount he paid to buy the option.

Writing Options: There is an entire market- called the options market- that helps these transactions go through. For every option holder there must be an option seller. This seller is often referred to as the writer of the option. So selling a put option is called writing a put. Anyone who owns the underlying asset, such as an individual or mutual fund- can write options.

Let's go back to our previous example. If you buy the July 1 call option on IBM stock with an exercise price of $70, you are betting that the price of IBM will go above $70 before July 1. You can make this bet only if there is someone who believes that the price of IBM will not go above $70 before July 1. That person is the seller, or "writer," of the call option. He or she first gets a non-refundable fee for selling the option, which you pay. If the price goes to $80 in June and you exercise your option, the person who sold the call option has to buy the stock from the market at $80 (assuming he does not already own it) and sell it to you at $70, thus incurring a loss of $10.

But remember that you had to buy the option originally. The seller of the option, who has just incurred a loss of $10, already received the price of the option when you bought the option. On the other hand, say the price had stayed below $70 and closed at $60 on June 30. The seller would have made the amount he sold the option for, but would not make the difference between the $70 strike price and the $60 June 30 closing price. Why not? Because as the buyer of the call option, you have the right to buy at $70 but is not obligated to. If the stock price of IBM stays below $70, you as the option buyer will not exercise the option.

Note: If the writer of the call option already owns IBM stock, he is essentially selling you his upside on his IBM stock, or the right to all gains above $70. Obviously, he doesn't think it's very likely that IBM will rise above $70 and he hopes to simply pocket the option price.

Summary options chart

	Action to take
Person believes a stock will go up	Buy a call
	Write a put
Person believes a stock will go down	Buy a put
	Write a call

Options Pricing: There are at least six factors that affect the value of an option: the stock price, exercise price, the volatility of the stock price, the time to expiration, the interest rate and the dividend rate of the stock.

1) **Pricing of underlying security**: If an option is purchased at a fixed exercise price, and the price of the underlying security stock increases, the value of a call option increases. Clearly, if you have the option to buy IBM stock at $100, the value of your option will increase with any increase in stock price: from $95 to $100, from $100 to $105, from $105 to $106. (The value of a put option in this scenario decreases).
2) **Exercise ("strike price")**: Call options can be bought at various exercise prices. For example, you can buy an option to buy stock in IBM at $100, or you can buy an option to buy stock in IBM at $110. The higher the exercise

price, the lower the value of the call option, as the stock price has to go up higher for you to be in the money. (here, the value of the put option increases, as the stock price does not need to fall as low).

3) **volatility of underlying security:** The option value increases if the volatility of the underlying stock increases. Let's compare similar options on a volatile Internet stock like Google and a more steady stock like Wal- Mart. Say that the Google stock price has been fluctuating from $70 to $130 in the last three months. Let's also say that Wal-Mart has been fluctuating from $90 to $110. Now let's compare call options with an exercise price of $100 and a time until expiration of three months. Although the average price for both stocks in the past three months has been $100, you would value the option to buy Google stock more because there is a greater possibility that it will increase well above $100. (Perhaps Google would rise to $130, rather than Wal-Mart's $110, if the previous three months were replicated.) The reason this potential upside increases the option's value is that the downside loss that you can incur is fixed. You have the option to exercise and not the obligation to buy at $100. No matter how low Google's stock might go, the most you would lose is the cost of the option. Volatility increases the value of both call and put options.
4) **Time to expiration:**. The more time the holder has to exercise the option, the more valuable the option. This makes common sense. The further away the exercise date, the more time for unpredictable things to happen and the broader the range of likely stock price increases. Moreover, the more time the option holder has, the lower the present value of the exercise price will be (thus increasing the option value). Like volatility, time to expiration increases the value of both put and call options.
5) **Interest rates:** If interest rates are higher, the exercise price has a lower present value. This also increases the value of the call option.
6) **Dividends:** A higher dividend rate policy of the company means that out of the total expected return on the stock, some is being delivered in the form of dividends. This means that the expected capital gain of the stock will be lower, and the potential increase in stock price will be lower. Hence, larger dividend pay outs lower the call value.

If this variable increases	The value of a call option
Stock price	Increases
Exercise price	Decreases
Volatility	Increases
Time to expiration	Increases
Interest rate	Increases
Dividend payouts	Decreases

Black Scholes model is the standard model for pricing options.

Forwards: A forward contract is an agreement that calls for future delivery of an asset at an agreed upon price. EX: Wheat. The revenue from the entire planting

season depends critically on the highly volatile price of wheat. The farmer can't easily diversify his position because virtually his entire wealth is tied up in the crop. The miller who must purchase wheat for processing faces a portfolio problem that is a mirror image of the farmer's. He is subject to profit uncertainty because of the unpredictable future of the wheat price. Both parties can reduce their risk if they enter into a forward contract requiring the farmer to deliver the wheat at a previously agreed upon price, regardless of what the market price is at harvest time. No money needs to change hands at the time the agreement is made. A forward contract is simply a deferred delivery sale of some asset with an agreed- upon sales price. The contract is designed to protect each party from future price fluctuations. These forwards are generally used by large companies that deal with immense quantities of commodities.

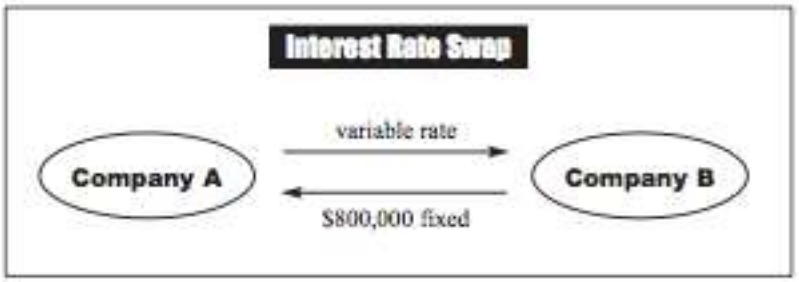
Futures: The future contract is a type of forward that calls for the delivery of an asset or its cash value at a specified delivery or maturity date for an agreed upon price. This price is called the futures prices, and is to be paid when the contract matures. The trader who commits to purchasing the commodity on the delivery date is said to be in the long position. The trader who takes the short position commits to delivering the commodity when the contract matures. Futures differ from other forwards in the fact that they are liquid, standardized, traded on an exchange, and their prices are settled at the end of each trading day (that is, the futures traders collect/pay their day's gains and losses at the end of each day). Futures are actively traded and liquid securities. For example, for agricultural commodities, the exchange sets allowable grades of a commodity (for example, No. 2 hard winter wheat or No. 1 soft red wheat). The places or means of delivery of the commodity is specified as issued by approved warehouses. The dates of delivery are also standardized. Futures are also available on other commodities, like gold and oil.

Swaps: A swap is a simple exchange of future cash flows. Some popular forms of swaps include foreign exchange swaps and interest rate swaps.

Foreign exchange swaps: Sun Microsystems outsources its software development to India on a regular basis. It would make payments to the firms in India in rupees, thus find itself exposed to foreign exchange rate fluctuation risks. To hedge these exchange risks, Sun would want to enter into a foreign exchange swap- a predetermined exchange of currency- with another party. For instance, it could enter into a swap with the Birla Group in India, which has many expenses in US dollars and is thus also subject to the same exchange rate fluctuation risk. By agreeing to a foreign exchange swap, both companies protect their business from exchange rate risks.

Interest rate swaps: Consider a firm (company A) that has issued bonds (which, remember, means essentially that it has taken loans) with a total par value of $10 million at a fixed interest rate of 8 percent. By issuing the bonds, the firm is obligated to pay a fixed interest rate of $800,000 at the end of each year. In a situation like this, it can enter into an interest rate swap with another party

(Company B), where Company A pays Company B the LIBOR rate (a floating or variable short term interest rate measure) and Company B agrees to pay Company A the fixed rate. In such a case, Company A would receive $800,000 each year that it could use to make its loan payment. For its part, Company A would be obligated to pay $10 million x LIBOR each year to Company B. Hence Company A has swapped its fixed interest rate debt to a floating rate debt. (The company swaps rates with Company B, called the counterparty. The counterparty gains because presumably it wants to swap its floating rate debt for fixed rate debt, thus locking in a fixed rate).



Questions:

1. When would you write a call option on Disney stock?
When you expect the price of Disney stock to fall (or stay the same). Because a call option on a stock is a bet that the value of the stock will increase, you would be willing to write (sell) a call option on Disney stock to an investor if you believed Disney stock would not rise. (In this case, the profit you would make would be equal to the option premium you received when you sold the option.)

2. Explain how a swap works.
A swap is an exchange of future cash flows. The most popular forms include foreign exchange swaps and interest rate swaps. They are used to hedge volatile rates, such as currency exchange rates or interest rates.

3. Say I hold a put option on Microsoft stock with an exercise price of $60, the expiration date is today, and Microsoft is trading at $50. About how much is my put worth, and why?
Your put is worth about $10, because today, you can sell a share of stock for $60, and buy it for $50. (If the expiration date were in the future, the option would be more valuable, because the stock could conceivably drop more.)

4. When would a trader seeking profit from a long-term possession of a future be in the long position?
The trader in the long position is committed to buying a commodity on a delivery date. She would hold this position if she believes the commodity price will increase.

5. All else being equal, which would be less valuable: a December put option on Amazon.com stock or a December put option on Bell Atlantic stock?
The put option on Bell Atlantic should be less valuable. Amazon.com is a more volatile stock, and the more volatile the underlying asset, the more valuable the option.

6. All else being equal, which would be more valuable: a December call option for eBay or a January call option for eBay?
The January option: The later an option's expiration date, the more valuable the option.

7. Why do interest rates matter when figuring the price of options?
Because of the ever-important concept of net present value, all else being equal, higher interest rates lower the value of call options.

8. If the strike price on a put option is below the current price, is the option holder at the money, in the money or out of the money?
Because a put option gives the holder the right to sell a security at a certain price, the fact that the strike (or exercise) price is below the current price would mean that the option holder would lose money. Translate that knowledge into option lingo, and you know that the option holder is out of the money.

9. If the current price of a stock is above the strike price of a call option, is the option holder at the money, in the money, or out of the money?
Because a call option gives the holder the right to buy a security, the holder in this scenario is in the money (making money).

10. When would you buy a put option on General Mills stock?
Because buying a put option gives you the option to sell the stock at a certain price, you would do this if you expect the price of General Mills stock to fall.

11. What is the main difference between futures contracts and forward contracts?
The main difference between forward and futures contracts is that futures contracts are traded on exchanges and forwards are traded over-the-counter. Because of this distinction, you can only trade specific futures contracts that are traded on the exchange. Forward contracts are more flexible because they are privately negotiated, and can represent any assets and can change settlement dates should both parties agree.

V. Brain Teasers (Breaking Into Wall Street)

1) What is the probability that the first business day of a month is a Monday?

2) What is the greatest dollar value in coins you can have in your hand without being able to make change for a dollar?

3) If the fair value of a CD today is $5 and it will be worth either $6 or $1 tomorrow, what is the probability that it will be worth $6 tomorrow?

4) You have a large cube (10x10x10) made up of small cubes (1x1x1). If I were to remove all of the small cubes with a surface on the exterior, how many small cubes would be left?

5) I have two coins, one of which is double-headed and one of which is normal. You randomly pick one and flip it 10 times and get 10 heads. What is the probability that you chose the double-headed coin?

6) You are standing outside a 100-story building holding two identical glass spheres and know that either sphere would shatter upon hitting the ground if dropped from the roof, but would not necessarily shatter if dropped from the first story. What is the least number of drops needed to guarantee that you have identified the lowest story from which you can drop the spheres without them shattering?

7) You have an object whose weight is an integer value somewhere between 1 and 100 and a balancing scale. What is the fewest number of weights you need to be guaranteed that you can correctly identify the weight of the object?

8) You have a birthday cake and have exactly 3 slices to cut it into 8 equal pieces. How do you do it? You need to cut in half, then make another cut - to get four pieces. NOW you stack these four pieces and make the last third cut - and you get 8 pieces.

ANSWERS:

1) This question is a fairly simple logic question designed to test how you think and specifically whether you underthink or overthink the problem. The person who overthinks the question would try to think through the number of days in each month and how the days have fallen historically to arrive at an answer. The person who severely underthinks the question would blurt out 1 in 7 and the person who shows some thinking, but gets the answer wrong would say 1 in 5 (because there are 5 business days). The correct answer is 3 in 7 because if the first day of a month is a Saturday, Sunday or a Monday then the first business day is a Monday.

2) This question tests your ability to reason logically to arrive at an answer. You would start with quarters because they have the greatest value and then move to dimes, nickels and pennies, taking the maximum number of each without being able to make change for a dollar. You could take 3 quarters, 4 dimes, 0 nickels (because 3 quarters, 4 dimes and 1 nickel would be a dollar) and 4 pennies for a maximum dollar value of $1.19.

3) This question tests to some extent your knowledge of finance as well as your ability to calculate expected value in a very easy problem. You would need to know that the fair value of the CD is its expected value. If the expected value of the CD is $5 and it is either $1 or $6 tomorrow then it must have a 20% chance of being $6 tomorrow because (.2)(6) + (.8)(1) = 5.

4) This question simply tests your ability to reason logically. You would discover that if you remove all of the small cubes with a surface on the exterior then you would be left with an 8x8x8 cube and therefore there would be 512 small cubes remaining.

5) This question tests your ability to calculate probabilities. It is a simple conditional probability question in which you calculate the probability that you had chosen the double sided coin given that you flipped 10 heads which is P(Double|10 heads) = 1/(1+0.5^10) = 1024/1025. The probability that you chose the double sided coin is 99.9%.

6) This question tests your ability to reason using iterative logic. If you were to add the series 1+2+3+4+5…, the first number on which you would cross 100 is 14 and thus the "14 drops" case is the most efficient iterative test. You would drop the first orb from the 14th then 27th then 39th then 50th then 60th then 69th then 77th then 84th then 90th then 95th and then 99th floor. If the first orb breaks at the 14th floor then you would test 1-13 and if it breaks at the 39th floor, you would test 28-38. No matter where the first orb breaks, you will always make 14 drops. This is the fewest number of drops you can make and be guaranteed to discover the highest floor from which you can drop the orb without it breaking.

7) This question once again tests your ability to reason logically. You would start at 1 and then figure out which numbers you would need to make every combination of numbers between 1 and 100. You would discover that with weights of 1, 2, 4, 8, 16, 32 and 64 pounds, you could make every value between 1 and 100 (you don't need a 3 lb weight because you could use the 1 lb and 2 lb weights to make 3 lbs, but you do need a 4 lb weight; you don't need a 5 lb weight because you can use the 1 lb and 4 lb weight to make 5 lbs etc.) and thus 7 weights is the fewest number of weights you would need to be guaranteed that you can find the weight of the object.

There is no way to prepare for every brainteaser. There are many that are commonly used in interviews and you can prepare for those, but remember answering the brainteaser the way the interviewer wants to hear it answered is more important than actually getting the answer correct. Remember not to lose your cool. Here's some more for practice.

- *18x22*

  Break it down. Do 18x20 + 18x2. Easy, 360 + 36=396. As far as brainteasers go, this is a rather common one.

- *Two boats are going towards each other at 10 miles per hour. They are 5 miles apart. How long until they hit?*

  Be careful here. The initial instinct is to say half an hour. However, both boats are moving at 10 miles per hour, so they are converging at 20 miles per hour, meaning they will crash in 1⁄4 of an hour, or 15 minutes.

- *How many NYSE-listed companies have 1 letter ticker symbols?*

  26, actually 24 because I & M are saved for Intel and Microsoft in case they change their minds.

- *A driver is going to drive 100 miles. If they drive the first 50 miles at 50 miles per hour, how fast do they have to drive the second to average 100 miles per hour for the entire run?*

  This is WRONG! Think about it for a second. They went the first 50 miles at 50 MPH, which means they drove for an hour. They want to drive the entire 100 miles at an average of 100 MPH, which means they would have to drive the entire 100 miles in only 1 hour. Since they have already been driving for an hour, it is impossible to average 100 MPH!

- *How many gas stations are in the United States*?

  With a question like this, the interviewer is looking at your thought process, not that you can actually figure out how many gas stations are in the U.S.
  The easiest way to go about answering a question like this is to start small and work your way out. Think about your town. Say your town has 30,000 people, and you have 5 gas stations serving that area. The United States has approximately 300 million people United States, and 50,000 gas stations.
  You then want to make adjustments. For example. Say assume that a quarter of the population lives in larger cities where there is only 1 gas station per 30,000 people. So you have 7,500 towns with 5 gas stations in the U.S.

Additional resources:

- Wall Street Journal
- Seeking Alpha
- The Vault Guide
- Breaking Into Wall Street
- Bloomberg
- Investopedia